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The Blind in Canada*

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THE number of known blind in Canada, of all ages, totals 12,344, representing those registered with the Canadian National Institute for the Blind, and those on Pension to the Blind. Apart from these, there is a very large group comprising those with loss of vision in one eye, or with some progressive type of eye disease, who do not as yet come within the definition of blindness as stated in the Act, together with some who have not made their condition known and whose names have not been brought forward. The definition of blindness is contained in Paragraph (a) of Subsection (1) of Section 8A of the Dominion Old Age Pension Act, and the principles to be applied in determining such conditions are found in Regulation 41 of the Regulations made pursuant to the said Act, as quoted hereunder:

For the purpose of certifying whether or not a person is "so blind as to be unable to perform any work for which eyesight is essential," the officers of the Department of Pensions and National Health shall be guided by the following:

(i) The test is not whether the person is unable to pursue his ordinary occupation or any particular occupation but whether he is too blind to perform every several kind of work for which eyesight is essential.

(ii) Only the visual condition shall be taken into account and other bodily or mental infirmities shall be disregarded.

(iii) The principal condition to be considered is the visual acuity (i.e., the best direct vision obtainable with each eye separately or both together where both are present, as tested by Snellen's type using proper refractive lens).

(iv) Persons with visual acuity equal to or less than 6/60 Snellen after correction by using proper refractive lens shall be certified as "so blind as to be unable to perform any work for which eyesight is essential."

**Presented at a meeting of the Dominion Council of Health (the scientific advisory body to the Department of Pensions and National Health) held in Ottawa March 23, 1943.*

(v) Persons with visual acuity of more than 6/60 Snellen after correction by using proper refractive lens shall not be be certified as "so blind as to be unable to perform any work for which eyesight is essential."

Section 42 of the Act reads as follows:

An application for a pension in respect of blindness may be made at any time after the proposed pensioner has reached the age of thirty-nine years and nine months.

In Table I the total number of blind is given according to age groups comparable with those in the Beveridge Report. The greater discrepancies in groups 2, 3, 4 and 5 are probably due to the more stringent definition of blindness used in England, as compared with Canada.

TABLE I

THE BLIND IN CANADA, JANUARY 1943
ACCORDING TO AGE GROUPS

Age group	*Number**	*Percentage of total, Canada*	*Percentage of total, England (Beveridge report)*
1. Under 5 years	13	0.105	0.3
2. 5 to 15 years	314	2.543	1.9
3. 16 to 39 years	1,977	16.015	12.5
4. 40 to 49 years	1,441	11.673	10.2
5. 50 to 69 years	5,177	41.939	38.8
6. 70 years and over	3,422	27.721	36.3
Total	12,344	99.996	100.0

*Males, 7,118; females, 5,226.

Of those shown above who are 40 years of age and over, 6,386 are pensioned under the Act. Their distribution by provinces is given in table II.

TABLE II

DISTRIBUTION OF BLIND BY PROVINCES, CANADA, JANUARY 1943

Population 1941 census	*Province*	*Number on pension*	*Rate per 1,000 population (Pensioners)*	*Not eligible*
453,377	New Brunswick	755	1.665	640
93,919	Prince Edward Island	113	1.203	33
573,190	Nova Scotia	621	1.083	179
3,319,640	Quebec	2,118	0.638	871
3,756,632	Ontario	1,516	0.404	261
722,447	Manitoba	373	0.516	32
887,747	Saskatchewan	320	0.360	37
788,393	Alberta	238	0.302	18
809,203	British Columbia	332	0.410	64
11,404,548	Totals	6,386	0.560	2,135

NOTE: The higher ratio of blind per 1,000 population in the Eastern Provinces may be due to the fact that they are the oldest settled parts of Canada, from which many young people have migrated West and to the United States.

1. From table II is will be noted that, as of January 1, 1943, there were 6,386 pensioners (col. 1) representing, at $240.00 per annum, a total expenditure for the past year of $1,532,640.00, the cost being distributed on the ratio of 75 per cent to 25 per cent between Federal and Provincial Governments.

2. There are also 2,135 (col. 3) who have applied for pension but were found to be "not eligible" because they are not sufficiently blind to qualify. Most of them will qualify within a few years and the group represents a possible further annual expenditure of $512,400.00, quite apart from the usual increase. It is among these applicants that treatment would be most beneficial.

The life expectancy of a blind person is considered normal. Old age pensioners live on the average about seven years following pension at seventy. Although both are grouped under the Old Age Pension Act, it should be borne in mind that the financial commitment is in no wise similar, because some of our blind pensioners may receive financial aid for thirty or forty years, if pensioned at the age of forty. Therefore, every effort should be made to prevent blindness in the first instance; second, treat and cure as many as possible and, finally, carry out a careful pre-pension selection.

Those who are familiar with that section of the Old Age Pension Act dealing with blind persons will have noted that there is no provision for treatment or prevention, with the result that many are drawing pensions who could be removed from the rolls by adequate treatment.

In order to obtain new information on this phase, a special form was introduced at the beginning of 1942, and completed by the oculists of the Department of Pensions and National Health at the time of making the official examinations for pension purposes. The results were checked after 534 forms had been received, and the following interesting information was obtained:

APPROVED FOR PENSION—356

Number of cases where treatment might restore useful vision	129 or 36%	No treatment recommended	227 or 64%

NOT YET ELIGIBLE—178

Number of cases where treatment would prevent or delay blindness	124 or 70%	No treatment recommended	54 or 30%

It will be seen from the above that 36 per cent of those awarded pension were, at the time of the award, considered curable to the point of restoring useful vision by treatment.

The summary also shows that it is among those not yet eligible that the greatest benefit would be obtained by treatment; 70 per cent of this group could have their blindness delayed or its possibility removed by proper care.

Treatment would consist mainly of cataract operations, but there are also many with strabismus, ptosis, pterygium and glaucoma, who also could have useful vision restored. Apart from operative treatment, there is a fairly large group needing general treatment for conditions affecting vision, such as

diabetes, syphilis, anaemia, malnutrition and avitaminosis, arteriosclerosis and nephritis, etc.

It is realized, of course, that many of those recommended for treatment may refuse to accept. Those indicated by the examining oculist as poor risks are not included in the above.

Observations lead us to believe that malnutrition plays a larger part in the production of blindness than was formerly thought. It is among the malnourished that infections of the external parts of the eye flourish and become chronic, with resultant scarring of the cornea. Diets high in vitamins will cure these cases but only so long as the diet is maintained.

As the large majority of those suffering from progressive diseases of the eye will sooner or later become a charge on the taxpayer, it is evident that the urgent needs at present are prevention and treatment, the latter at no cost to the individual, prevention being largely a matter of public health.

Health departments are already deeply involved in the prevention of blindness, even though their legislation was not planned primarily for that reason, except in the instance of preventive drops for ophthalmia neonatorum. The other endeavours that are preventive in character are: venereal disease control, the distribution of Insulin to those unable to pay, prevention and control of tuberculosis, nutrition measures, control of all types of infectious diseases, school medical inspection and the provision of sight-saving classes, and accident prevention.

From the above it would seem desirable to place the whole problem of blindness, both its prevention and treatment, in the hands of the departments of public health, where it logically belongs. It is understood, of course, that departments of health would not be expected to maintain treatment centres for this purpose but they should undertake to provide direction, probably under some pre-arranged plan of payment, in order that those who could be helped by treatment do not go without, because of technicalities, and eventually become a total charge on the State.

Another point worthy of consideration is that in many instances those applying for pension have suffered a gradual loss of vision over a period of years, with a corresponding loss of earning power and a resultant lowering of the standard of living even to the point of absolute want, which in itself must adversely affect the nutrition of the eye.

Causes of blindness among pensioners are difficult and intricate to compile because we are endowed with two eyes which seem prone to become affected by different conditions.

Marshall and Seiler (Glasgow) in their study of the causes of blindness, as reviewed on page 518 of the Lancet of October 31, 1942, are quoted as follows (1):

"In assessing the importance of different causes it was found that a different result was obtained if the second eye was taken as the cause of blindness than if the first was chosen. The result published are on the basis of the

second eye, and thus if one eye is blind from myopia and the second eye is blinded by injury that person's blindness is classified under injury."

This is undoubtedly one way out of the difficulty and makes a statistical summary possible, but it still leaves us lacking certain information indicating the original condition which started the train of events towards blindness. Our experience indicates that those losing one eye for any reason seem prone to have trouble eventually with the second eye.

Apart from bilateral cataract, optic atrophy and glaucoma, the causes of blindness are extremely varied. Among the pensioners in one of the Provinces the chief pathological reasons for granting pension are—cataract, optic atrophy, glaucoma, myopia, retinitis and corneal scars, together with a great variety of mixed conditions. There are also more hereditary eye conditions than one would expect. Cataract holds the greatest possibility for restoration of sight, by operative measures, but many other conditions respond to general treatment, to some extent. A great deal of damage appears to have been done by unchecked infections of various types, aided by poverty and ignorance of the outcome.

The present legislation in respect to pensions to blind civilians is administered by the Federal Department of Finance, under an Amendment to the Old Age Pensions Act, and blind pensions are administered provincially through the Old Age Pension Commissions or Boards. It will be noted that although blindness is in every case a pathological condition the Act is controlled by non-medical departments. The Department of Pensions and National Health is charged only with the responsibility of assessing the degree of blindness and ruling whether or not the applicant comes within the provisions of the Act.

At the present time there is no arrangement whereby the Provincial Old Age Pension Authority may provide treatment to restore sight where it is thought possible by the oculist, or to apply treatment for those with failing vision who may become a total charge on the State if left untreated.

In the United States there are many ways of helping the blind and ten States have even gone to the extent of legislating that those who refuse reasonable treatment to restore sight shall be denied aid (2). This is not the rule, however, and it is generally felt that the well-trained social service nurse or social service worker can bring about treatment where there is a reasonable chance of success. Certain States report substantial sums of money saved through the establishment of adequate treatment facilities and they are equally enthusiastic concerning the prevention of blindness in that group who are not yet eligible for pension. They have proved beyond doubt that a large measure of blindness can be prevented, and a portion of those already blind can be made to see.

Payment of pensions to blind persons is limited by the Act to people who have reached the age of forty years. It is difficult to understand why a young adult on the threshold of life and blind, is or less consequence than a man of forty. The young person, with the aid of treatment or training, may become self-supporting, while our experience leads us to believe that if nothing is attempted until the blind are past middle life very little can be done from the standpoint of rehabilitation, largely because of lost initiative and vigour.

Pensions should be linked with treatment and training and given only when the other two fail, and the age limit should be lowered to twenty-one years or even less, considering that the blind or partially sighted have either no or a greatly reduced earning capacity until trained.

The employability of the 1,631 registered blind between the ages of 20 and 40 years, as provided by the Canadian National Institute for the Blind, is as follows:

Blind males, employed	400
" " partially employed	468
" " unemployable	153
Blind females, single, employed	150
" " " partially employed	230
" " " unemployable	67
Blind females, married, employed	15
" " " partially employed	124
" " " unemployable	24
Total	1,631
The unemployable group includes:	
Unemployable, mental	142
" other	102
Total unemployables	244

From the above summary, the high employability of the blind between the ages of 20 and 40 will be noted. Only 244 were capable of earning, and they could be pensioned at the small cost of $58,000.00 per annum, although it might be well to consider subsidizing the partially employed, to bring their earnings to the level of full pension.

Much is now understood concerning the causes, prevention and treatment of blindness. It only remains to integrate and apply this knowledge under the proper department of government. Years of experience have taught us what extraordinary things the blind can accomplish in almost any walk of life, given a little encouragement and opportunity. Let us not open the door grudgingly, but throw it wide.

ACKNOWLEDGMENT

Thanks are due to the Canadian National Institute for the Blind for statistical information.

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Immunization Against Influenza A

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IN a previous paper (Hare, McClelland and Morgan, 1942) a method for the concentration and partial purification of influenza A virus in the allantoic fluid of developing hen's eggs was described. Suspensions of virus prepared in this way, inactivated with formaldehyde and frozen and dried, have been employed for the immunization of groups of persons in various parts of the Dominion during the winter of 1942-43. Various methods of dosage were employed and comparison made between the value of concentrated virus suspensions and vaccines made from allantoic fluid without alteration. This paper is an account of these experiments.

Experimental Methods

Preparation of Vaccine

This was carried out exactly as described by Hare, McClelland and Morgan (1942), the egg-adapted PR8 strain of influenza A virus being used. The titre of each lot was measured by the red cell agglutination method. Inactivation was carried out by the addition of sufficient formalin to give a concentration of one in four thousand formaldehyde. The vaccines were kept at ice-box temperature for four days to allow the formaldehyde to act. They were distributed into ampoules, frozen and dried in a dessicator. Before use they were reconstituted by the addition of sterile distilled water. No attempt was made to remove the formalin by dialysis or the addition of ammonia. Sterility and toxicity tests were carried out before use.

Administration of the Vaccines

Except in one small series, a dose of 1 cc. was employed for all persons. Two doses of this amount were given 9 or 10 days apart subcutaneously in the outer surface of the upper arm. There is sufficient free formalin present to cause a considerable amount of stinging, lasting for a minute or so, over the site of the injection. Very few general reactions were observed and they were in no case serious. Local reactions were more numerous and consisted in varying degrees of swelling and redness. No reactions suggestive of egg sensitivity were encountered although subjects known to be egg-sensitive were not given the vaccine.

Titration of the Sera

The antibody level of the sera was determined by the agglutinin inhibition method, using chick red cells and influenza A virus. The actual technique

followed closely that of Hirst (1942), the only major departure being the use of half the quantities he specified and tubes made from ordinary glass tubing having an internal diameter of 5 mm.

Allantoic fluid from 14-day-old chick embryos, infected 48 hours previously with the PR8 strain of influenza A, was used. It was stored in quantities of 5 to 10 cc. in a dry-ice refrigerator. When a series of titrations was required, a tube was removed, the rubber stopper taken out and the tube inverted in order to get rid of all the carbon dioxide in the tube. The contents were then allowed to melt at room temperature with frequent shaking. The tube was then placed in a beaker containing water at 37°C. to ensure complete re-suspension. When this was achieved, the tube was kept in ice-cold water.

The virus titre was then determined by the agglutination of chicken red cells as described by Hare, McClelland and Morgan (1942). The tubes were left at room temperature for one hour only and read by comparison between standards as described by Hirst (1942). The allantoic fluid was then diluted in such a way that, in the inhibition test described below, the dilution of the allantoic fluid in each tube was one-fourth of its agglutination titre. Thus, if the end point as determined by agglutination of red cells was 1/128, the allantoic fluid was diluted in such a way that all the tubes in the inhibition test would contain allantoic fluid in a dilution of 1/32.

For the test proper, eight tubes of 5 mm. internal diameter were set up and 0.25 cc. of serum in two-fold dilutions ranging from 1/4 to 1/512 added. To each tube, 0.25 cc. of allantoic fluid diluted as above was added, and then 0.5 cc. of a 2 per cent suspension of thrice-washed red cells in saline. The contents of each tube were well mixed by bubbling air through with a pipette and they were allowed to stand out of direct sunshine on the bench for one hour. They were read by comparison with standards, the tube whose supernatant was midway in density between standards containing 0.75 per cent and 0.5 per cent red cells being taken as the end point.

All sera were inactivated at 56°C. for 30 minutes before use. The lowest dilution of serum in this test was 1/16. This was chosen because it is quite unusual for the titre to be below this figure and a considerable economy was effected, only 0.125 cc. of serum being actually used for each test.

RESULTS

In the first experiment, an attempt was made to determine whether one, two or three doses of vaccine were necessary. The vaccine consisted of a concentrate having a titre of 1/1024 which had been made from a pool of allantoic fluid which had a titre of 1/128. It was given in 1-cc. doses subcutaneously at weekly intervals to six normal adults.

Blood was withdrawn before the series of injections, immediately before each injection and again seven days after the last injection. The four specimens of serum obtained from each individual were then titrated, the results being given in figure I.

There is no doubt that the concentrated vaccine contained considerable amounts of antigenic substance, for all six subjects responded well. Inspection of the chart will show that two doses were evidently as good as three, there being an increase in the titre after the third dose in only one subject.

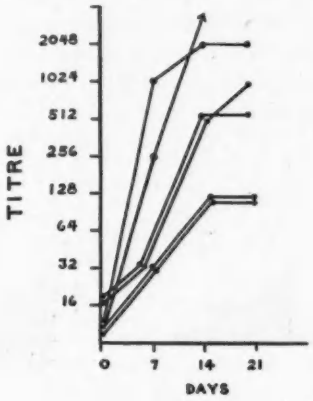

FIGURE I.

Titres Seven Days After One, Two and Three Doses of Concentrated Vaccine.

In the next experiment, accordingly, an attempt was made to ascertain whether one or two doses would suffice. For this purpose, a concentrated vaccine was also used. This had a titre of $< 1/2048$ and had been made from a pool whose titre was 1/384. Sixteen normal adults were given 1 cc. of this vaccine, 12 days later they were given 1 cc. of normal saline (because it was not desired that they think they had had any less immunization than the other groups), and 7 days after this blood was withdrawn. A second group of 13 were given two doses of the vaccine, the second dose 12 days after the first, and blood taken 7 days later as in the first group. The sera were titrated as before. The results are given in figure II.

There is no doubt that even one dose of the concentrated vaccine produced a very adequate response, the arithmetic mean of the increase in titre being 41.5 times. For some reason, those receiving two doses had a lower increase in titre the mean being 24.0 times. The geometric mean of the titres (which is a more accurate method of measurement than the arithmetic mean) after one dose was 585.95 and after two doses 489.80.

These results indicate that a considerable increase in the titre of antibody may be obtained by the injection of only one dose of concentrated vaccine. They also show that a soluble antigen present in allantoic fluid is probably not required to produce this type of immunity, for in the process of preparation almost all the soluble antigen is removed.

It must be stressed that the preparation of concentrated vaccine of this

order is by no means an economical proceeding or even a very easy one. On an average, rather less than one dose can be made from each egg. For this reason, the value of unconcentrated allantoic fluid was next investigated.

The vaccine was a dried formalized and unconcentrated allantoic fluid whose titre was 1/96. This was chosen because it is, in our experience, a fair average titre for unaltered fluid. Twelve adults were given one dose of this material, the same scheme being followed in all respects as that employed for the concentrated vaccines. Another group of eleven was given two doses 12 days apart. The results are given in figure III.

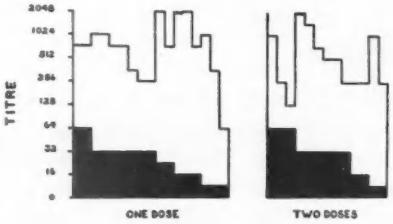

FIGURE II.

Titres Before and After One or Two Doses of Concentrated Vaccine. Solid Columns Give the Titre Before Vaccine, Open Columns, Titre After Vaccine.

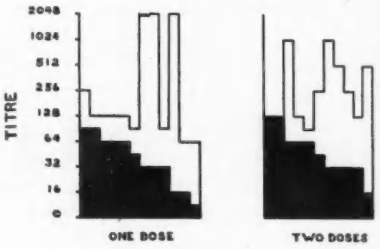

FIGURE III.

Titres Before and After Unconcentrated Vaccine.

The mean increase in titre amongst those receiving one dose was 23.4 and in those who received two doses it was 9.0 but the geometric mean of the titres after one dose was 244.0 and after two doses 265.6.

It is obvious that the response to the unconcentrated vaccine was not so good as with concentrated material. The increase in titre of those receiving two doses was also lower than that of the group receiving one dose, a result similar to that obtained with concentrated vaccine.

IMMUNIZATION OF LARGER GROUPS

While the above experiments were in progress, groups of university students in different centres throughout the Dominion were given two doses of 1 cc. of concentrated vaccine 10 days apart. There were 262 in this group and 259 in another group who received saline and no vaccine. These immunizations were finished in January 1943. No blood was taken from any of these individuals before the immunizations. They were asked to report any infection of the upper respiratory tract during the subsequent three months.

An epidemic of respiratory tract infection occurred during February and March 1943. There is reason to believe that this was in no instance due to influenza A, although this question is reported upon in more detail in an accompanying paper (Hare, Stamatis and Jackson).* Blood was taken from every case reporting during the acute phase of the infection and again during convalescence.

*To be published in the October issue of the JOURNAL.

In Table I, the inhibition titres for influenza A of the sera taken during the acute phase of both immunized and control groups are given. It is obvious that the immunization proceedings which had been carried out a month or two previously had altered very considerably the antibody level of the population. The level of those who had been immunized was far above that of the control group, the geometric mean of the former being 204.8 and of the latter, 21.4. In

TABLE I

TITRES OF ACUTE PHASE SERA OF IMMUNIZED AND CONTROL GROUPS

Titre	Immunized with 2 doses of 1 cc. concentrated vaccine	Controls who had received 2 doses of 1 cc. saline
Total subjects	57	30
> 16	....	4
16	....	9
32	2	2
48	1	1
64	1	5
96	5	....
128	10	4
192	4	....
256	15	....
384	1	....
512	9	1
1024	6	....
2048	3	....
Geometric mean	204.85	21.43

view of the absence of influenza A in these localities, it is not possible to indicate whether immunity had been produced, but comparison between the titres reached as a result of immunization and those reached after infection might provide a clue.

TITRES OF PATIENTS SUFFERING FROM INFLUENZA A INFECTIONS

Hirst (1942) and Hirst, Rickard, Whitman and Horsfall (1942) have carried out titrations on acute and convalescent phase sera from cases of influenza A, using the inhibition of agglutination method. Unfortunately there is considerable divergence between the results in the two papers, due presumably to a change in methods of measurement. For this reason, the titres of all the acute and convalescent phase sera still available from cases of influenza A in Canada during recent years, were determined by the same method as that employed for the tests on vaccinated persons. Included are 9 sera from patients in the small epidemic which occurred this year and described in a paper by Hare, Hamilton and Feasby.*

The results appear in figure IV, in which the titres obtained in neutralization tests in mice are also given. These end points are that titre of the serum which will protect 50 per cent of the mice against 1000 minimum lethal doses of PR8 virus. It will be observed that there is a rough parallelism between the two methods of test, a result previously obtained by Hirst (1942) and ourselves

*To be published in the October issue of the JOURNAL.

(McClelland and Hare, 1941). The titres of the convalescent sera in the inhibition test are almost identical with those obtained in a somewhat smaller series by Hirst (1942) in which the same method of measurement was used as in this communication. On the whole, these titres are rather lower than those reached in the immunization procedures. The geometric mean, for instance, was 195.95, which is lower than the means obtained with concentrated vaccine—585.95 and 489.8, with unconcentrated vaccine—244.0 and 265.6, or in the larger groups who were immunized with concentrated vaccine in different parts of the Dominion whose mean titre was 204.85.

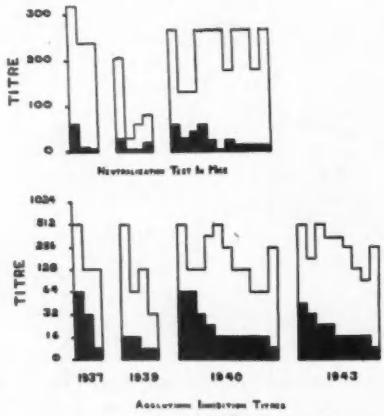

FIGURE IV.

Titres of Acute and Convalescent Phase Sera of Cases of Influenza A Infection. Solid Columns Indicate the Titre of the Acute Phase Serum and the Open Columns, That of the Convalescent Serum.

These estimations therefore suggest that immunization with either concentrated or unconcentrated vaccine may produce profound alterations in the titre of the serum antibodies for influenza A, and that the level reached by the antibody in almost all the subjects receiving vaccine was as high as that encountered during convalescence from an actual infection, if not higher. Whether this had produced immunity cannot be stated, but Henle et al (1943), using a somewhat similar type of antigen, showed by actual infection experiments that a considerable degree of immunity to experimental infection could be produced.

DISCUSSION

The experiments quoted in this paper show that a vaccine made by concentrating the virus in allantoic fluid according to the method of Hare, McClelland and Morgan (1942) is strongly antigenic, so that serum taken after immunization has a high titre as measured by the agglutinin inhibition test. The levels reached as a result of these procedures are as high, if not higher, as those reached

by patients convalescent from the disease itself. But whether the immunization had conferred actual immunity is another matter and until an immunized population is subjected to an epidemic, this cannot be answered.

According to these results, it would appear that a higher antibody level is obtained with a concentrated vaccine than with allantoic fluid which has been untreated. This might have been expected. Nevertheless there was a possibility that a soluble antigen which may have been present in allantoic fluid but is removed when the vaccine is made, might have been of importance. It is improbable that this is so, certainly where the production of agglutinin inhibiting antibody is concerned, although it may be required for the production of sufficient immunity to protect against the disease. This question also remains to be answered.

Whether or no, one or two doses of vaccine should be given is a moot point because the increase in antibody level was in general lower when two doses were given than with only one. This occurred with both concentrated and unconcentrated vaccines. The reasons for this are not immediately apparent other than the possibility that there may have been a negative phase in Wright's sense of the term.

It must be stressed that the use of the concentrated vaccine is not as yet a very practicable proposition when large numbers are to be immunized. The actual process of concentration is not particularly difficult but the yield, no matter what method be used, is bound to be small. For little more than 7 or 8 cc. of fluid can be collected from each egg, and if this be concentrated ten times, as was done in these experiments, it follows that less than one cubic centimetre of completed vaccine can be obtained from each egg.

On the other hand, unconcentrated vaccine was definitely a less powerful antigenic stimulus than the concentrated, some subjects having scarcely any rise in titre at all. Therefore, supposing the vaccine doses confer immunity, the problem may well become one of production.

CONCLUSIONS

1. The immunization of normal adults with concentrated influenza A vaccine is described.

2. The response, as judged by serological methods, was greater than with unconcentrated vaccine.

3. The response was in general greater than that seen after a clinical attack of influenza A.

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Canada and Tropical Disease

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Surgeon Lieutenant Commander, R.C.N.V.R.

CANADA has been free of tropical disease for many decades. Some of the reasons are obvious. The climate has a wide seasonal range of temperature. Rainfall is moderate. Living space is not crowded. Between our seaports and the continents of Asia and Africa lie wide ocean barriers. Our trade with Central and South America has been limited. Overseas plane arrivals are carefully checked. Immigration from China, India and Africa, where the natives are heavily infected, has been practically non-existent. European immigrants are examined before leaving their homeland and again on arrival in Canada. There has been no incoming traffic from the north. In the south, the United States Public Health Service is constantly battling to keep endemic tropical disease localized. It is fairly safe to say that no cases of tropical disease have been reported in Canada in the past three decades which have not been introduced from other countries. The few cases which were brought in burned themselves out in a short time without infecting others.

The question has been raised whether Canada can maintain this favourable picture. There are those who feel that a considerable influx of tropical disease may appear here as part of the war's aftermath and that from this potential reservoir the rest of the population may become affected. They support their contention with the following argument.

Is there a Tropical-disease Threat to Canada?

Historically there is documentary evidence suggesting that malarial ague was known in the St. Lawrence valley, about the Rideau canal, close to the present site of the Welland canal and along the Niagara escarpment. These records date from the days of the early Jesuit Fathers to as late as 1857. Records exist showing that serious outbreaks of cholera and typhus accompanied the arrival of European immigrants during the early part of the last century. At that time leprosy was vastly more common in the St. Lawrence valley alone than it is today throughout the whole Dominion.

The gradual disappearance of these diseases in Canada over the past century may be explained in part by improved sanitation, restricted immigration, and various not wholly understood natural causes. The question persists whether they can flare up again under special conditions. We are reminded that outbreaks of malaria keep occurring south of the international border. Anopheline mosquitoes capable of transmitting malaria have been identified in all provinces except Saskatchewan and the Maritimes, where for all we know they may be present but not yet identified. Culicines and aedes capable of serving as the vectors of dengue and yellow fever are prevalent across the country. Endemic typhus, tick-borne relapsing fever and Rocky Mountain spotted fever

are being reported in areas ever closer to the Canadian boundary and even appearing sporadically in Western Canada. Observers point with concern to the probable increase in tourist and trade traffic with the West Indies, Central and South America as soon as conditions permit. Much of this communication will be air-borne and the parties should arrive in Canada shortly after leaving the infected areas. Finally, it is feared that Canadian troops, engaged in those parts of the world where the infective index is high, will return bringing their baggage and parasites with them.

The Argument Against Any Sizable Increase in Tropical Disease Incidence

There is a good deal of sound argument on the other side to show that there is little likelihood of tropical disease becoming of real importance in Canada. Firstly, the return of our troops after the last war was not followed by any increase in the incidence of these diseases in the general population. Tropical disease among our troops in Sicily and North Africa is being vigorously fought by hygienic measures, suppressive prophylaxis and thorough treatment. Diagnosed cases are recorded on the papers accompanying the soldier, and he himself will be able to recall his former illness when he returns to Canada. There have been a few scattered cases of malaria in our naval escort vessels attached to the Mediterranean squadrons. Sandfly fever has been a pest but it is not a cause of concern either from mortality figures or transfer to civil populations after the war. If the figures were available concerning prisoners of war in the Canadian and American internment camps, we would probably find that they have brought amazingly few infections into their new environment. Naturally there will be odd cases of malarial relapse and a few cases of dysentery as well as occasional illness from previous fluke infections, but this is to be expected. These groups should prove excellent controls as to what may be forecast concerning any tropical-disease threat from the Mediterranean.

As far as malaria is concerned, we still require the three major factors which must be present to produce an epidemic in any population, civil or military. They are: sustained rainfall, warmth, and a critical ratio as between large numbers of proper mosquito vectors and a one to two per cent of people parasitized with sexual forms of the plasmodia. These people must live in unscreened dwellings within mosquito-flight range of susceptibles. There has been no well-organized mosquito survey over more than local areas in Canada and we cannot therefore appraise the mosquito situation properly. Widespread farm-drainage projects have reduced the swamp areas of earlier days. By far the larger part of Canada's population living in mosquito areas screen their doors and windows. Plasmodia require two weeks' development in the mosquito in our climate and the four summer months are relatively dry. There is very little standing water in our urban localities. A large proportion of our returning troops come from these relatively mosquito-free urban communities. Even presuming that a few missed cases of malarial relapse are admitted after the war, they should be easily kept under control. Early recognition, reporting, isolation in screened quarters until parasite-free, and epidemiological follow-up in the area should be all that

is required. Furloughed missionaries, tourists and business men from the infected areas who quite frequently have a relapse on their return to this climate have never been any menace to us. As a rule they are city dwellers and seek medical advice early.

It is known that amoebic cysts can be recovered from the stools of a considerable number of the present population on this continent, but in this disease there is a great difference between infection and active dysenteric symptoms. Dysentery of amoebic origin is not an important problem now and one sees no reason why it should increase to any appreciable degree in the post-war era Odd cases will occur but the reason why a carrier who has never had an acute attack of bloody dysentery should become active has not yet been solved. Most of the epidemics in recent history have been water-borne through cross-contamination of sewage and drinking water, and the ingestion of cysts must have been in relatively heavy dosage.

Louse-borne typhus and relapsing fever will be controlled by disinfestation in the disembarkation centres at the coasts. Passengers on incoming planes will be subjected to increasing scrutiny on arrival and may be required to submit to examination or compulsory reporting at a health centre at a stated time after arrival. Most air-borne passengers are economically in the group who can afford immediate and skilled medical care. Rat, flea, typhus and the tick-borne rickettsial fevers may slowly find their way into our midst but this is not a post-war problem *per se*. Immunization procedures against cholera, yellow fever, typhus and dysentery are now available for troops in areas where these diseases flourish and the incidence should therefore be relatively small.

Tropical Disease Formerly Global

Much of what is referred to as "tropical disease" or "exotic disease" was at one time global in distribution. It survives to-day in countries where modern sanitation and living standards are not the accepted way of living. Poverty, ignorance, illness and non-acceptance of the germ theory of disease origin still account for the natives' willingness to "get along with disease" rather than attack its causes. In Canada our public health standards and conscience are daily growing more active. One feels that there is danger that we may lose our sense of perspective in appraising the potential dangers of tropical disease. Cases will appear without doubt, but one feels that there will be no significant alteration in the over-all disease picture. It must not be magnified out of proportion to its relative importance.

Study of Tropical Disease Necessary

This does not mean, however, that medical officers in the services, along with quarantine officials, medical officers of the Department of Pensions and National Health, and public health officials should pass lightly over the subject. For the next decade we shall have to be on the alert in seeking out the underlying causes of obscure fevers. There will probably be in each community one

or two service medical officers who will have familiarized themselves with the diseases common to their forces in the field. Thus the problem need not necessarily be viewed with alarm.

In the occupied zones and in New China where an accelerated reconstruction program is anticipated, there will be an opportunity for specially trained tropical epidemiologists to serve as advisers to the local authorities. To help provide these experts Canada should be preparing at least a few first-class tropical hygienists. Several of the medical schools are already expanding their teaching program in this field. It is more than likely that at least one Canadian school will be prepared to issue a course leading to a Diploma of Hygiene and Tropical Medicine in the near future.

SUMMARY

Perspective must be maintained when considering any menace to Canada's civil population as a result of the possible introduction of tropical disease at the war's end. There will probably be no significant change in the usual disease incidence in this country, except perhaps in the rickettsial diseases. Service medical officers require some special training in the subject before appointment to affected areas. Trained hygienists will be required in the tropics as consultants for many years to come.

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The Family Roster Service in Lamont Health District

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THE object of rural health district services in Alberta, as in other Provinces of Canada, is to provide a public health service for the whole population of the district. Where such a district is organized, the health officer naturally surveys his field to ascertain what activities would bring the greatest returns in the shortest time. For a number of reasons he almost invariably begins with services for infants and preschool and school children. These groups are most susceptible to preventable communicable diseases, they are most readily accessible, and parents tend to lavish more care on the younger members of the family than on the older ones. This probably is as it should be. But in a few years the health officer becomes aware that the returns from his efforts with these age groups diminish. The immunization program is well advanced and adequately maintained. The frequent physical examination of school children is time-consuming. The cooperative parents have followed recommendations for corrections while progress with the others is slow. Visits by the nurses to the homes are made primarily with the object of inducing parents to have necessary corrections made and to record those that have been made. Gradually a service that was begun with great enthusiasm by the staff becomes less interesting and before long it is realized that probably an undue amount of effort is expended in serving a relatively restricted, though very important section of the population.

LAMONT HEALTH DISTRICT — FAMILY ROSTER

Householder — S. D. — P. O. — Date

Location — Informant

Name	M / F	Int.	Date of Birth	Living or Dead	Date and Cause of Death	Occupation
Husband						
Wife (middle name)						
Children						
Other				Relation to H. H.		

"FAMILY ROSTER" FORM USED BY THE LAMONT HEALTH DISTRICT.

That is the story of the Lamont Health District. Home visits were made largely in the interests of school children. Theoretically they were also to establish contact with the home; actually they probably did, but certainly no more. Because no written record of the visit was kept except in so far as it pertained to members of the family who had been examined by the staff, each visit was in fact a new visit. It is not possible to remember such visits in essential detail from year to year. New staff members would of course have no acquaintance whatever with the problems of the home.

To overcome many of these criticisms our staff collaborated late in 1941 in the preparation of a family roster or family record form, referred to by Mustard in "Rural Health Practice." Early forms were mimeographed on foolscap sheets. They were awkward to handle in windy weather and clumsy to file in the office. A number of revisions, after field trials, resulted in the 8" x 10" form printed on a light Bristol Board as shown. It is creased to fold to 5½" x 10" and is filed in alphabetical order by School Districts.

The form used would of course vary from one health district to the next, depending largely on local conditions and the object it is designed to achieve. We had in mind the following objectives:

1. To secure a reasonably accurate census.
2. To gain an estimate of the economic status of the household and the occupation of the head of the family.

Land Location	Owner		P. O.	
No. Living in House	Type of Bldg.	Frame	City	Stucco
Sleeping Rooms	Beds		Toilet	
General Cleanliness				
Households on Farm		Car	Truck	
Length of Residence in District				
Racial Origin of Householders	Husband		Wife	
Family History: Mental	Ca.		T. B.	
Heart	Others			
Co-operativeness, etc.				

"FAMILY ROSTER" FORM (REVERSE SIDE).

3. To gain information concerning sanitary facilities and the general cleanliness of each household.
4. To secure records of past illnesses and deaths in the community and where possible the causes.
5. To locate the most urgent cases for provincial mental hygiene clinics and tuberculosis clinics outside the school population.
6. To locate the homes most in need of services which we can render.
7. To achieve more intimate contact with all homes, and make records of progress or co-operation on subsequent visits.
8. To locate the homes which might be called on for assistance in case of an emergency such as an epidemic.

During 1942 seven hundred and four home visits were made. The people visited are generally pleased with the apparent attention to detailed matters concerning the family and its home facilities. Rural farm life often lacks excitement, and the opportunity to unburden themselves to an interested listener is welcomed by many a farmer and his wife. They feel that they have found a new friend whose genuine interest in their affairs is evident from the fact that she records their remarks. A word of approval of a newly painted floor or a well-protected well is encouraging. Sensible arguments for fly-proofing a privy, adjusting the baby's formula, or suggestions for improving the diet are then more likely to be heeded. Where former visits were more perfunctory and less likely to give opportunity for discussion, the family roster offers many openings for almost any difficulty to be reviewed.

The number of home visits one nurse can make in a day varies of course with the density of the population of the area, the attitude of the people visited and the problems encountered. Generally eight to ten visits make a very full day. The work is quite fatiguing (emotionally as well as physically sometimes) but it gives a sense of accomplishment and of usefulness that was not present to the same degree in other informal visits. The staff assumes more of the functions of a social worker than it did formerly.

The following are some of the more interesting figures compiled from the family rosters completed in 1942.

Households visited	704
Average number in a household	5.57
Average number of children in a family	4.15
Average number of children born to a family	4.78
Occupation of head of household—farmers	87.09%
Construction of houses—Clay	26.07%
Frame	64.06%
Stucco	8.03%
Brick and stone	.45%
Houses owned by occupants	83.08%
Average duration of residence in Health District	25.07 yrs.
Homes clean	82.00%
Toilets present (in 200 of 249 homes)	80.33%

Vital statistics for this area are reported to the Provincial Bureau through this office. Births and deaths are entered on the roster forms as reported, which helps to keep them up to date. Recently the health district budget was increased to allow us to provide cod liver oil for all infants and preschool children. The family roster, with exact information as to the number of children in each home and their ages, is of great value to us in determining the amount of oil that should be ordered and in the preparation of a card index for this service.

RÉSUMÉ

The Family Roster Service of the Lamont Health District, Lamont, Alberta, has been described. The service is useful for the assessment of home facilities, economic status and general health needs of the population. It provides a reasonably accurate census and facilitates the work of new staff members. The tabulation of the information gathered is an arduous task but a profitable one. It discloses conditions not suspected until they appear in statistical form.

Errors in the Calculation of the Nutritive Value of Food Intake

III. COMPARISON OF CALCULATED AND DETERMINED AMOUNTS OF IRON

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IN the first two papers of this series (1) (2), differences between calculated and analytically determined values for calories, fat, protein, and ascorbic acid of actual meals were reported. These investigations have been part of a study on sources and magnitude of errors likely to occur in dietary surveys. In a continuation of this study a comparison has been made of calculated and actual values for the iron content of a series of twenty-one meals served in the cafeteria of the Connaught Laboratories.

Since iron is not likely to be lost from foods by reactions, such as oxidation, which cause destruction of one or more of the vitamins, it seems probable that the chief loss of iron in food preparation is by solution in cooking water. Unless this loss is large it might be expected that the iron content of prepared meals may not be greatly different from the amount present in the raw foods and that there might be less discrepancy between calculated and actual values than was found in the case of ascorbic acid (2).

Analytical Procedure

Duplicate samples, approximately one-fourth of an average serving, of all constituents of each meal, except tea and coffee, were weighed. The samples for each meal were mixed thoroughly in a Waring blendor and the finely minced material was washed with 50 ml. of water into a beaker. The mixture was dried, ground in a mortar, and mixed until uniform. Ten-gram aliquots were used for iron determinations, made by the procedure of Koenig and Johnson (3), as follows:

The samples were wet-ashed by successive treatment with nitric and perchloric acids. Digestion was continued until all obvious organic matter was oxidized and the volume of the residual solution was between 20 and 50 ml. The solutions were cooled, washed through porcelain filtering crucibles, and the filtrates diluted to 250 ml. Fifty-ml. portions of the filtrate were evaporated to dryness and treated successively with sulphuric acid, hydrogen peroxide, and perchloric acid, with intermediate and final evaporation to dryness. If the residue was not bleached satisfactorily, the process was repeated. After the addition of a small amount of sulphuric acid the residue was taken up with water. The solution was boiled for 30 minutes to cause hydrolysis of pyrophosphates. For iron determinations suitable aliquots of the final solution were treated with

ammonium hydroxide and mercaptoacetic acid reagent. Any precipitate was removed by centrifugation and decantation before the colour developed was measured with a Coleman Universal Spectrophotometer, using a wave-length of 535 millimu. The amount of iron was determined by reference to a standard curve.

As a standard, ferrous ammonium sulphate hexahydrate was used, made up in acid solution and oxidized with bromine. The standard solution contained 0.2 mg. of iron per mil. A series of standards was prepared by placing various volumes, to give from 0.05 to 0.5 mg. of iron, in 50 ml. volumetric flasks. These solutions were neutralized to Congo red paper with 4 N ammonium hydroxide, 10 ml. of mercaptoacetic acid reagent and 2 ml. of 4 N ammonium hydroxide were added, and the volume of liquid in each flask was made up to 50 ml. After thirty minutes galvanometer readings were made with the Spectrophotometer. The graph of the logarithms of the galvanometer readings, plotted against concentration, was found to be a straight line. This was the standard curve used for estimating the iron content of the food samples. Standard curves prepared at different times showed remarkably good agreement. Generally duplicate determinations on food samples gave very close results.

It should be noted that only total amounts of iron were determined. No attempt was made to measure "available iron," since most food tables record only values for "total iron."

Calculation of Iron Content of Meals

Since the food tables issued by the Canadian Council on Nutrition have been used for calculations in most Canadian dietary surveys, these tables were used for calculations of iron content of the meals for which analytical determinations were done. With respect to iron values these tables are quite complete, except for data on cooked foods.

Comparison of Calculated and Actual Amounts of Iron

Table I gives the values for each of the series of 21 meals.

It will be noted that the calculated values fell within a range of ± 10 per cent error of the analytically determined values in 3 out of 21 cases and that the complete range of error, expressed as percentages of actual values, was from -35 to $+244$. This is a wide deviation. In only two meals was it possible to trace the discrepancy to an item present in these meals and accounting for a large proportion of the iron content: lima beans, which provide 55 per cent of the iron content of meal 20, and dried apricots, which gave 28 per cent of the iron content of meal 16. No one definite food as a source of error could be assigned in other cases.

When the data were analysed by a method of Snedecor for paired figures (4), the F value was found to be 0.96. Since this is much less than the figure of 4.35 required for significance (5 per cent point), the difference between the actual and theoretical values cannot be significant for the series. It may be concluded that, if calculations were made for a sufficiently large number of meals,

the actual total iron intake would probably be fairly close to the calculated value on the average. Because the range of individual difference is so large, it cannot be considered that there is good agreement between actual and calculated values for single meals in most instances. Calculation of the iron content of one or two days' meals is likely to give an inaccurate picture of average iron intake.

TABLE I

COMPARISON OF CALCULATED AND DETERMINED AMOUNTS OF IRON

Meal	Iron Content Actual	Iron Content Calculated	Calculated Minus Actual	Error as % of Actual Value
1	13.6	8.8	—4.8	—35
2	10.4	9.2	—1.2	—11
3	10.4	6.4	—4.0	—35
4	8.0	8.4	+0.4	+5
5	8.0	6.0	—2.0	—25
6	6.8	6.0	—0.8	—12
7	6.8	4.8	—2.0	—30
8	6.4	6.4	0.0	0
9	6.4	5.6	—0.8	—12
10	6.4	4.4	—2.0	—31
11	5.6	9.6	+4.0	+71
12	5.6	6.8	+1.2	+21
13	4.8	5.6	+0.8	+17
14	4.8	6.4	+1.6	+33
15	4.8	6.0	+1.2	+25
16	4.4	8.4	+4.0	+91
17	4.0	8.4	+4.4	+111
18	4.0	5.6	+1.6	+40
19	4.0	4.4	+0.4	+10
20	3.6	12.4	+8.8	+244
21	3.2	6.0	+2.8	+87
Average			0.6 ± 3.1	+27

Two sources of error may have affected the results of this study. Some calculations of iron contents were made for raw foods but allowance was not made in these cases for losses during preparation. It will be noted that the average percentage error was 27 per cent, showing that the average calculated value was that much greater than the actual iron content of food as served. Much of this plus error may have been due to losses during cooking. A second source of error is the difficulty of estimating accurately, for calculation purposes, the proportion of foods in mixed dishes. This second factor operates, of course, in calculations used in dietary surveys.

The principal purpose of this study was to determine the errors in dietary surveys, incurred by calculating the nutritive values of consumed foods. In five Canadian surveys the calculations were based on the food tables used in the present study and all records of food consumption were for 21 meals, the number used by us. The results here reported indicate that iron intakes found in the Canadian surveys are somewhat in excess of actual values but that the difference is not sufficiently great to alter interpretation.

SUMMARY

In a series of twenty-one meals, although the actual iron content of individual meals (as determined by analysis) showed wide variation from calculated values, the average difference for the series was not great. Calculations of iron intake for a few meals might be quite erroneous but, if based on a sufficiently large number of meals, would agree with actual values closely enough for practical purposes in dietary surveys.

This study was made possible by a grant from the Committee on Food Analysis of the Canadian Council on Nutrition, to whom thanks are expressed.

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The Canadian Nurses Association and Health Insurance*

A Submission to the
SPECIAL COMMITTEE ON SOCIAL SECURITY
of the
HOUSE OF COMMONS
April 13, 1943

1. Organization, Membership, and Objectives of the Canadian Nurses Association

THE Canadian Nurses Association is a federation of the nine provincial nurses associations. It was founded in 1908 and its further development is a story of rapid growth. It now has a membership of over 19,000, of whom 760 are English-speaking and 440 French-speaking Catholic Sisters and 1,650 French-speaking nurses.

The membership of the Canadian Nurses Association includes all registered nurses practising in Canada with the exception of approximately 6,900 nurses in Ontario and possibly a very few in Prince Edward Island. In both these provinces the Act governing registration of nurses is distinct from membership in the provincial registered nurses association, although registered nurses in these provinces are eligible to join the provincial associations and many of them do so. In the seven other provinces registration includes membership in the provincial registered nurses association. In all these associations membership is renewed each year.

The national office of the Canadian Nurses Association is at 1411 Crescent Street, Montreal. The official organ of the association is *The Canadian Nurse*.

Membership in the Canadian Nurses Association is drawn from every branch of nursing service; this includes hospital, public health, home visiting and private duty nursing.

Since its inception the objects of the Canadian Nurses Association have been:

To promote national unity among nurses in Canada;
To elevate the standard of nursing education and practice in order to render the best type of public service;
To stimulate in its members an active interest in community welfare;
To encourage the attitude of understanding towards nurses of other countries.

These are the objectives as stated in the constitution of the Canadian Nurses Association.

**Presented by Miss Marion Lindeburgh, President of the Association.*

In any modern community, nursing service is rightly regarded as an indispensable public utility. It has an essential place in health insurance. The responsibility of interpreting nursing service and of presenting recommendations for its most effective implementation in any health insurance plan is one that rests with the Canadian Nurses Association, as the national organization representing registered nurses throughout Canada.

2. NURSING SERVICES REPRESENTED WITHIN THE CANADIAN NURSES ASSOCIATION

The nursing services sponsored and supported by the Canadian Nurses Association are included in three major fields:

(*a*) *Nursing in Hospitals.*—Nursing service in hospitals conducting schools of nursing is provided by graduates and students. Nurses' aides and helpers are also employed to undertake non-nursing duties. Until recent years the nursing load was carried almost entirely by student nurses. This practice is unsound from the point of the student and the patient. The student's clinical program should be carefully planned to meet her educational needs, rather than to meet the demands of hospital nursing service, and patients in many instances are too ill to be nursed by students. Hospital administrators have become aware of the need for stabilizing nursing services, and improving the quality of nursing given through the employment of graduates as general staff nurses. Over three thousand more graduate nurses are employed in general duty in hospitals throughout Canada to-day than was the case ten years ago.

Besides the general nursing staff, the nursing personnel includes those with post-graduate preparation and experience who are responsible for the administration and supervision of the various nursing services. Nurses with special technical training are employed in X-ray, physiotherapy, and other hospital departments.

(*b*) *Private Duty Nursing.*—Approximately 75 per cent of nurses in Canada are engaged in private duty nursing. The value of the good private duty nurse in conditions of serious illness cannot be questioned. One of the existing weaknesses in private duty nursing service as it exists to-day is in the fact that the patient who can afford to pay the cost for private nursing care receives it, while the patient who urgently needs it may go without because of lack of the necessary financial resources.

The establishment of an eight-hour day for private duty nursing is long overdue. It has placed, however, an additional financial burden on the patient requiring continuous nursing care, while the actual income of the nurse has not been increased. The yearly average income of the private duty nurse does not provide for more than a subsistence maintenance. When a health insurance plan is established this situation should be alleviated to a great extent.

In every province placement bureaux or registries are established for the purpose of answering all calls for nurses who are accepting employment on a daily basis. These registries experience much difficulty in the adequate distribution of nurses and in securing the most suitable nurse for the particular patient.

The prerogative of choice suggested in a submission to this committee for doctor and patient might equally apply to the nurse-patient relationship. It is significant to note that with very few exceptions the financial upkeep of nurses' registries is maintained by the nurses themselves, with no assistance from the community which they serve. Presumably the scope of these placement bureaux will be enlarged under any scheme of health insurance. Therefore it would seem that the necessary financial support should be considered for their maintenance.

(*c*) *Public Health Nursing.*—This service includes home visiting, school nursing, industrial nursing, preventive and health work in child welfare, maternity, tuberculosis, venereal diseases and other special fields in which public health nursing has become an essential part of a health program in both rural and urban communities. Health teaching is an important function in all public health nursing work. Public health nursing is administered by official and voluntary agencies. These services as administered by provincial and municipal departments of health have proved their value. Nurses with special preparation are being needed in increasing numbers for staff and supervisory positions in public health departments across the country.

There are several well-organized voluntary nursing services organized to meet community nursing needs in all parts of Canada. The standards of qualifications of staff and systematic supervision provided reflect the calibre of these organizations.

It is particularly important that in the development of a health insurance plan which is to provide adequate medical and nursing care in conditions of illness and to promote the health of individuals and families that the above-mentioned nursing services be recognized by physicians, hospital and public health authorities, as well as the general public, in order that available services may be fully utilized.

(*d*) *Schools of Nursing,* the source of supply from which all nursing service stems.—Increased nursing demands will inevitably result from any health insurance plan. It is therefore of primary concern that schools be well maintained in the establishment of health insurance. A continuous supply of properly prepared nurses must be assured. Adequate educational and residential facilities are essential.

There are 166 approved schools of nursing in Canada conducted by general hospitals, with a total enrolment of approximately 11,000 students. About 3,000 of these graduate annually. Nine universities conduct either schools or departments of nursing. The standards for approval of schools and eligibility of nurses to register are determined by acts governing the registration of nurses within each province, although reciprocal registration privileges exist between the nine provinces.

In order to ensure an adequate supply of well-qualified graduate nurses to support a health insurance plan, it is necessary that enrolment be maintained in schools of nursing of a sufficient number of desirable students. If this enrolment is to be sustained at a satisfactory level, it is obvious that students in schools of nursing must be offered advantages equal to those recognized as

essential in other forms of education and that these must be afforded under conditions that support sound principles of learning.

It is essential that properly qualified teachers and supervisors be responsible for the classroom and clinical experience of student nurses. This is of vital importance from the point of view of nursing service in hospitals, because the quality of nursing care which students render to patients is in direct relation to the quality of teaching and supervision which they receive.

It must be borne in mind that clinical facilities are as necessary for nursing education as for medical education. Only through continued practice of nursing patients under adequate supervision can the student become skilled in nursing arts. A definite ratio of graduate nurses to students is essential in a good school of nursing.

Reasonable hours of duty and allowance of time for study and recreation are obviously part of any educational program. This applies to both students and the nursing staff. Provision should be made for these.

All these factors indicate the necessity for financial assistance from governments to maintain the necessary quality and quantity of nursing essential in any health insurance scheme. The generous aid given through the Department of Pensions and National Health in 1942 to assist schools of nursing to increase student enrolment has quickly evidenced the value of financial support.

3. ANCILLARY NURSING SERVICE

The care of convalescents and others who do not require highly skilled nursing care is recognized as very important in meeting the needs of the community. In order to safeguard the public, it is essential that all nursing and ancillary services be provided through organizations which are representative of registered nurses. In many provinces ancillary nursing service is already provided through placement bureaux conducted by the registered nurses association.

HEALTH INSURANCE

We come now to a closer consideration of nursing in relation to health insurance.

1. *The Canadian Nurses Association Approves the General Principles of Health Insurance*

The Canadian Nurses Association has been interested for some time in the subject of health insurance and in the initiation of a plan by which nursing services could be utilized most effectively in meeting the health needs of the people of Canada.

Since 1934 a special committee of the Canadian Nurses Association has functioned for the purpose of studying schemes of health insurance in the event of the adoption of a plan on a federal or provincial basis.

In 1935, at a conference between federal and provincial ministers of health on the question of health insurance, the Canadian Nurses Association presented a plan of nursing service for consideration. Again in 1938, the Committee on Health Insurance and Nursing Service of the Canadian Nurses Association prepared a brief which was submitted to the Royal Commission on Dominion-Provincial Relations, in which emphasis was placed upon the importance of

making provision for adequate nursing service as an integral part of a health insurance scheme.

The Canadian Nurses Association is interested and anxious to participate in any plan whereby the best which organized nursing can offer will be preserved and utilized to the greatest advantage.

The six principles of health insurance which appear in the report of the Honourable the Minister of Pensions and National Health, and recorded in the minutes of the proceedings of March 16th, are worthy statements, the first of which is basic to an effective nursing service: "No scheme of health insurance can be successful without a comprehensive public health program of preventive nature." This statement implies that effective public health education and health supervision must be made possible.

Because of the shortage of nursing staff in hospitals and public health nursing organizations over a period of years, teaching as an essential aspect of nursing has been the weakest feature. Sufficient time and a well-qualified staff are necessary for effective health teaching and supervision.

The nursing benefit as included in the draft bill under consideration embraces essential factors relating to organization, administration and control of nurses and nursing which were outlined in greater detail in the brief submitted by the Canadian Nurses Association at an earlier date. It would appear to cover the fundamental policies upon which provincial nurses associations can build their recommendations pertaining to nursing service, when the provinces implement a health insurance plan.

The recommendation made by the Canadian Hospital Council (item 18 under the caption "Essential Principles") is of vital importance. In part it reads as follows: "Because of the vital importance of the health of our people to the national welfare, it is most desirable that the direction of the plan be kept strictly non-political."

2. *Nursing an Essential Service in a Health Insurance Plan*

Health insurance for the people of Canada means in the first instance a greater recognition and appreciation of the benefits of medical care in the therapeutic, preventive and health measures. The expansion of medical services is inherent in the scheme. This fact will necessitate the extension of nursing services in all fields in the development of a plan in which the co-ordination of medicine and nursing is essential to the welfare of the individual whether in the home or the hospital. These services are complementary to each other.

3. *Nursing under Health Insurance*

(*a*) Representation on the commission and advisory boards.

Standards of nursing and problems of nursing service are best understood by the nursing body, therefore in the interests of the people to be served it is recommended:

That, when the health insurance plan is organized, federally and provincially, responsible registered nurses be appointed to all boards and committees whose functions include the direction or supervision of nursing services and that these appointments be approved by organizations representative of registered nurses.

(*b*) Control of standards of qualifications and nursing service.

The advance in medical sciences and the trend toward specialization in medical practice have affected the objectives and practice of nursing. Nurses must be prepared to function in special fields and in various executive capacities. It is becoming increasingly recognized that certain positions should be filled only by nurses with special preparation and experience.

Departments of nursing in universities offer courses which qualify graduate nurses for teaching, supervisory and administrative positions. To assure effective administration and supervision of nursing in a health insurance plan it is of vital importance that the selection of qualified personnel be in relation to the responsibilities of the positions to be filled.

(*c*) Distribution and stabilization of nursing services. The importance of a satisfactory nursing service in rural areas needs to be emphasized. More recognition and assistance should be given to nurses working under many handicaps in outlying parts of the country. If conditions of living could be made more attractive, and service more remunerative, the nursing needs of rural communities could be met more adequately.

Small hospitals in rural areas have difficulty in securing and retaining satisfactory nursing personnel. Salaries are usually low, and this coupled with limited social and educational advantages tends towards too frequent change in nursing personnel. The rural population of Canada is deserving of better medical and nursing services than have been supplied heretofore and provision for the necessary facilities for adequate health services is an important consideration in the health service plan.

The greatest handicap in attempting to stabilize nursing services in all fields, in hospital and community, arises from too long hours, inadequate remuneration and insufficient time to allow for satisfactory accomplishment of nursing care. Routine hospital duties are in too many instances assigned to nurses, both graduates and students, which could and should be delegated to ward aides and helpers. It is apparent that the nurse's time should be conserved for the care of the patients, and non-nursing duties assigned to a lesser skilled and lower salaried worker. All these factors predispose to discontent, discouragement and instability of the nursing personnel.

With the increase of hospitalization which inevitably will accompany health insurance, provision should be made for adequate nursing staff and more satisfactory working conditions.

CONCLUSIONS

While the inclusion of the nursing benefit in the draft bill is evidence of the recognition of nursing as an entity in the plan of health insurance, it must function as an integral part in the whole scheme. A mutual understanding of the objectives and activities of all groups involved is necessary for the most effective co-operation in a co-ordinated health insurance plan.

The Canadian Nurses Association wishes to assure the Special Committee on Social Security that its members very earnestly desire to share in the development of a plan which will safeguard and promote the health of the people of Canada.

The Place of Mental Hygiene in National Health Insurance*

A Submission to the
SPECIAL COMMITTEE ON SOCIAL SECURITY
of the
HOUSE OF COMMONS
May 18, 1943

1. Introduction

THE wide field of mental illness constitutes the largest special medical and hospital problem in Canada. (See Appendix A.) The field of psychiatry has expanded tremendously within recent years. The question of patients in mental hospitals, which formerly was practically the sole concern of the psychiatrist, is now only one of many divisions in this field.

The health of the community has been called one of the foremost concerns of government, and health includes inseparably both physical and mental well-being. Problems of mental health and ill-health begin in the earliest years of childhood. The problems continue in the school, where cases of retarded mental development are often first recognized and where early and perhaps reversible symptoms of actual mental illness are also observed. Later, in industry, success or failure may be as much a question of mental stability as of physical fitness. Moreover, all social relations and community organization depend upon the wholesomeness of individual personalities. Finally, medicine now recognizes the great importance of the mental aspect of all illness, and indicative of this fact has been the marked shift in the attitude of the medical profession whereby the fields that have been called "general medicine" and "psychological medicine" have merged into what is now called "psychosomatic medicine".

The field of mental illness covers a variety of conditions which can be classified under the general heading of "psychopathic states". They occur at all ages, from infancy to the last decades of life, and require many different types of facilities for diagnosis and treatment. The chief psychopathic states are as follows:

1. Mental disorders—including mild and severe forms of both "neurosis" and "psychosis".
2. The epilepsies.
3. Mental defect.
4. Addiction to alcohol and narcotic drugs.
5. Psychopathic personality.

The terms "insanity", "psychosis", "mental illness", which in usage mean

**Presented by Dr. B. T. McGhie, Deputy Minister of Health and Hospitals, Province of Ontario, on behalf of a national committee.*

much the same thing, have been applied to conditions with which the general practitioner as a rule does not wish to deal and with which most general hospitals do not wish to deal, although both general practitioner and general hospital are prepared to deal with all other medical conditions. On the other hand, so-called "nervous" conditions, the "neuroses", have commonly been found suitable for treatment both by the general practitioner and the general hospital. Thus, an unfortunate distinction has been maintained, with sinister implication for the patient suffering from "mental illness". Occasionally, in the lay mind and too often in the professional mind, it is mainly the apparent seriousness or conspicuousness of symptoms which determines whether the case shall be called a psychosis or a neurosis. In actual fact, however, the field is one and the separation merely artificial. The family physician and the medical officer of health must be prepared to consider all aspects of health, physical as well as mental.

The number of cases presenting themselves for psychiatric care is steadily increasing, apparently somewhat more rapidly than population growth. We should not take this as evidence that mental disease is on the increase. The increase is largely due to recognition of milder cases, formerly disregarded, and to the growing tendency to bring cases earlier to medical attention; likewise, to the widening recognition by physicians that a large part of general practice problems centres in the personality and mental life of their patients. Estimations by physicians in active practice have shown that from 20 per cent to 70 per cent of their patients present psychiatric or mental hygiene issues, which are either the essential feature of the case or complicating factors which equally require attention in the treatment program. It would probably be fair to say that 50 per cent of all patients visiting doctors' offices are not exclusively cases of physical illness but have psychological problems as well.

2. PREVENTION

In the first place, obviously, the family medical adviser of to-day and of the future must have some acquaintance with both preventive and curative aspects of mental illness. On the preventive side he must be able to apply the principles of mental hygiene in dealing with illnesses and difficulties of childhood and of school children and, likewise, with many industrial disabilities involving questions of fatigue, friction and general inefficiency. He must recognize the psychological aspect of disturbed home and family relationships and the psychopathology of marriage. On the treatment side, he must be able to apply any possible corrective measures in all of these conditions.

Crucial are the many problems of adolescence in which medical advice is sought, and in which proper measures taken in time may avert disastrous results which would otherwise follow. At the turn of life in the involutional period and in old age, questions of wholesome living arise which are really psychiatric problems and should be dealt with as such.

It will be seen that the bulk of these matters, which are definitely questions

of the mental health and stability of the individual and of the community and need treatment like any other disabilities, do not require hospitalization at all. They are problems of the increasingly important field of preventive medicine in its broader interpretation.

The seriousness and scope of these problems have been more keenly appreciated within recent years but means to deal with them are inadequate. Between the mental hospital on the one hand and the general hospital with its out-patient services on the other, there is a broad health field which is not effectively covered. The first requisite is trained personnel. This means that the curricula in medical schools should be amplified to qualify students in preventive psychiatry just as in preventive medicine generally; that opportunity should be provided for physicians in practice to get some training and experience in this field; that in the allied services—nursing, social service, occupational therapy and education—training in mental hygiene should uniformly be provided both for undergraduates and graduates.

It may be mentioned here that psychiatry was the original form of state-supported medical care. The relationship between mental institutions and general hospitals has unfortunately never been very close, although it has been improving in recent years. This circumstance has contributed in the past to keep psychiatry and general medicine apart. The separation has been unfavourable not only for psychiatry and for general medicine but also for the patient. It is no doubt in considerable part responsible also for a relative lag in psychiatric research and education. Fortunately, the earlier barriers between these intimately related fields are breaking down; but there is urgent need for more vigorously promoting the inter-relationship between psychiatry and the other medical sciences. The recent emergence of many new forms of treatment is evidence that the process is going on.

The most important step toward integration of the medical fields has been the establishment of full psychiatric services in general hospitals. One may question whether a hospital deserves the title "general" which does not provide psychiatric service. The Henry Ford Hospital in Detroit might be cited as an example of a general hospital which for twenty years has maintained a complete psychiatric service. The experiment proved to be entirely successful. Patients are admitted without legal formalities, there is free transfer of patients between the psychiatric and other wards; and internes, nurses and staff physicians get experience in dealing with both the physical and psychological features of illness, obtain a more adequate conception of both and thus become better physicians and nurses.

As has been mentioned, the most important field in psychological medicine is outside the mental hospital and in the community. This importance is due not only to the bulk of the material but also to the fact that in this field there is the greatest hope for the success of preventive measures. It is here that travelling mental health clinics play so large a part. Their value has been amply demonstrated in several provinces. Hitherto these clinics have travelled out from the provincial hospitals. This relationship at the present time is only one of con-

venience, and such clinics should be more closely integrated into the community health program. They could also be based on public health centres in the various districts. They would have a regular schedule of visits to surrounding communities, serving areas which altogether would equal the dimensions of the province. The clinics would handle cases voluntarily seeking advice and help, and cases referred by parents, teachers, physicians, social agencies and courts. They also could help in the education of the public on mental health matters through personal contacts and lectures. By such means it should be possible to keep in the community, and often wholly or in part self-supporting, many persons who would otherwise eventually have to be provided for in the provincial hospital. The institution of these clinics necessarily involves a greatly increased psychiatric staff, including physicians, social workers and psychologists.

In a complete service which would deal adequately with both the prevention and curative aspects of mental illness, the preventive work would be taken care of largely by the mental health clinics above-mentioned. The hospitals, both mental and general, and including in- and out-patient services, would provide for active treatment cases. Under after-care would be included not only the regular follow-up of discharged patients, but particularly a greatly expanded boarding-out system.

In the expansion of psychiatric staff, attention should be given to specially trained social service personnel. These workers are indispensable in all phases of the provincial system—in the preventive work of the travelling clinics, in in- and out-patient hospital services, in follow-up and after-care and in the supervision of patients in boarding-out homes. In connection with preventive work it would be highly advantageous to have sufficient social service staffs at hospitals or health centres to answer the frequent calls which come from the community for assistance in dealing with psychiatric problems not readily handled through one of the regular channels. Workers at present attached to the various social agencies for the most part lack psychiatric training, to their great disadvantage.

In any remodeling of provincial psychiatric services, the question of legal formalities deserves serious consideration. The legal formalities now required for the treatment of psychiatric patients in hospitals are often painful to patients and their relatives and prejudicial to patients' interests. These formalities have contributed to the separation of psychiatry from general medicine, and foster the so-called stigma attached to mental illness. A psychiatric disability is the only kind of sickness which requires a separate and individual process of law to get a patient under treatment in a hospital. This anomalous situation is a residual consequence of an earlier social attitude toward mental illness, when laws authorizing confinement of persons "insane and dangerous to be at large" were made for the protection of society and not primarily with the welfare of the mentally sick person in view. In later years, as the focus of attention shifted gradually to the protection and well-being of the patient himself, the laws were modified in the direction of safe-guarding his interests. In the main, however, the declaration or implication that he is unsuitable to be at large, that he is not of sound and disposing mind and is therefore to be regarded as irresponsible and that he

may be legally deprived of his liberty, remains an unpleasant formality which serves in no way the purpose of treatment.

In order to ensure the progressive improvement of all methods of control of mental diseases, future planning should include ample facilities for scientific research into the causes and treatment. For this purpose, research units can be established at centres where clinical material and laboratory facilities are available. Individual staff members at any centre should also be given time and opportunity to study specific problems. The organization of the services must leave room for the careful analysis and appraisement of the results of the forms of preventive or curative treatment advocated from time to time.

3. TREATMENT

A brief statement concerning the treatment needs of each of the chief types of psychopathic state now follows.

1. *Mental Disorders*

Neuroses, often called "nervous" conditions, are mental disorders. These are very numerous among children and adults but most cases can be treated at home or by office practice. If hospitalization is needed, most such cases can be cared for in general hospitals, very few requiring mental hospital care.

The cases of psychosis or "insanity" comprise the largest group requiring hospitalization. During the incipient stages, intensive treatment at home, by mental health clinic, or by a psychiatric ward in a general hospital, may prevent acute symptoms and lead to recovery. Where such treatment is unsuccessful, mental hospital facilities should be made available. It is estimated that there should be at least four beds per 1,000 of the general population. Most mental hospitals are seriously overcrowded, insufficient beds having been made available in proportion to the needs of the population. A mental hospital should be operated in accordance with the "minimum standards" which were set up by the American Psychiatric Association in 1925 and re-affirmed from time to time since. (See Appendix 2.) This association is an international one and the "minimum standards" were drawn up by a special committee appointed to study the problem and which included a Canadian member. These standards, although necessarily modified in some respects in war time, represent the indispensable conditions of mental hospital management and effective service to the mentally ill. To build a properly constructed and equipped hospital to accommodate 1,000 to 2,000 patients would cost $2,500 to $3,500 per bed. Additions to existing hospitals could be built in most cases for $1,500 to $2,000 per bed. The "family care" plan of caring for mentally sick persons (to be described later) could obviate this capital outlay and maintenance charge for as many patients as can satisfactorily be cared for under that plan. It might also be noted that the actual cost of patients in hospital varies with individual provinces but will usually be between $7 and $8 per week. This contrasts with $5.50 to $7 per week for patients in family care, including cost of supervision and incidental expenses.

2. *The Epilepsies*

Epileptic persons constitute about 250 to 400 per 100,000 of the population but most of these can be treated at home or by office practice. Only the more severe cases, including uncoöperative, dangerous and mentally disordered, require special hospital facilities, at the rate of 25 beds per 100,000 of the general population.

3. *Mental Defect*

These constitute about 1,000 to 1,500 per 100,000 of the general population, but only 100 to 150 per 100,000 require special institutions for training, treatment and care. The great majority can be cared for at home and trained in the auxiliary classes of the school system.

4. *Addiction to Alcohol and Narcotic Drugs*

Although the smallest group of psychopathic states, it represents a distinct problem in treatment. Most provinces at the present time provide care and treatment for this group only in the wards of mental hospitals, although some are cared for in general hospitals and others in penal institutions. Because of the close relationship of addictions to mental disorders, it is recommended that a separate building, especially equipped, with full treatment facilities, be provided. Further it is suggested that such an institution should be operated by the federal government.

5. *Psychopathic Personalities*

While many persons may have individual peculiarities, oddities or eccentricties, there is a considerable number whose personalities are so weak, warped, or pathologically eccentric from birth or early life that, without being intellectually deficient, they never succeed in making a satisfactory adjustment to life or in becoming useful citizens. Many of these sooner or later come into conflict with the law and thus are seen in our courts or penal institutions. No province at the present time takes official cognizance of this group in its mental hospital acts, but the fact that such a group exists warrants the use of psychiatrists and psychologists in our courts and penal institutions, for the proper diagnosis and treatment (advisory to the court) of all persons committing crime. Other types of psychopathic states, such as mental deficiency, epilepsy and certain psychoses, may also in whole or in part cause anti-social behaviour, which constitutes additional reasons for better psychiatric and psychologic facilities than exist at present.

Special Treatment Facilities for Psychiatric Disorders

(*a*) *Mental Health Clinics.*—These have already been referred to under preventive measures. Their importance for consultation and treatment, particularly of the less severe or incipient conditions, needs emphasis. Travelling from city to city and using the out-patient facilities of general hospitals enables them to work in close co-operation with physicians, hospitals, schools, courts and

welfare organizations. For the dual purposes of prevention and treatment, one clinic, consisting of psychiatrist, psychologist and one or more social workers, with adequate clerical assistance, can serve approximately 200,000 people in urban areas or 100,000 in rural areas.

(*b*) *Psychiatric Wards in General Hospitals.*—The realization that the mentally sick are really sick people who may need very complete examinations and consultations for diagnosis and adequate treatment calls for the establishment of properly equipped wards in all general hospitals of fifty beds or more (and at least one or more properly equipped rooms in smaller hospitals). Limitations of time and space do not permit a lengthy discussion of this most important development but we feel it is essential to the proper care of citizens who may develop mild or severe mental disorders. Such a ward would be for short treatment only; prolonged illnesses would be cared for in mental hospitals.

(*c*) *The Elderly Mentally Ill.*—The actual number of people above the age of sixty is gradually increasing in relation to the younger age groups. There are also certain disease processes which occur more frequently in the latter decades of life, such as nutritional disorders and diseases of the heart, arteries and brain. Since these elderly persons constitute such a large proportion of citizens, it is important that they receive the medical attention necessary for their welfare. As a parallel to hospitals for sick children and the specialty of paediatrics generally, it is recommended that separate facilities (at existing provincial hospitals or otherwise) be provided for the treatment of elderly people and for research investigation into their health problems, a specialized field of medical practice now known as geriatrics. At the present time people above the age of sixty constitute more than 20 per cent of the admissions to mental hospitals, adding definitely to the problem of overcrowding. (See Appendix 4.) It is recommended that hospitals for elderly people be suitably staffed and equipped to care for all types of illness common to advancing years, including mental illness.

(*d*) *Family Care of Mentally Sick Persons.*—The family care or boarding-out system means that selected hospital patients are placed in approved homes in a community within convenient access to the hospital, where they can be cared for with a minimum of supervision and lead as active a life as possible. The hosts in boarding-out homes are instructed as to necessary care and precautions. These patients are carried on the books of the hospital and may be returned to the institution without formality if occasion requires, and the hospital remains responsible for their maintenance and care until they are suitable for discharge in the regular way. Supervision could be maintained by a mental health clinic where such clinic is attached to the hospital, otherwise the hospital would have to supply medical and social service personnel adequate to take care of the boarding-out patients.

It has been demonstrated by the experience in California that this system can be greatly expanded with advantage to all concerned. By making the boarding-out plan one of the primary objectives of the state service, California has achieved the record figure of more than 21 per cent of the total number of patients on the books of these mental hospitals now placed in boarding-out

homes. In Ontario, between 3 and 4 per cent of all patients on the books are now placed under family care.

The boarding-out system serves three purposes: (*a*) it provides the most suitable form of treatment for many patients; (*b*) it measurably relieves overcrowding in hospitals; (*c*) it reduces the need for new construction.

(*e*) *Private Accommodation.*—As suggested in the federal recommendations for health insurance, all citizens who require it will be entitled to free hospitalization for mental illness. It is therefore recommended that provincial hospitals be equipped and staffed to give adequate standard care and treatment, leaving to the private sanatoria the field of providing extra amenities for those patients who desire to pay for such extras, at least for a period of time, until the prognosis can be determined. In those provinces where private accommodation exists, the provincial authority, with Dominion assistance, might well pay towards the maintenance of each patient an amount equal to the per caput cost of standard care and treatment. The Private Sanatoria Act in each province might be amended to protect the interests of all concerned.

General Comments

With free mental hospital care authorized for all who need it, there is likely to be a greatly increased demand for such care. The two main groups for which such additional accommodation will be needed are the mental defectives (adults and children) and the elderly mentally sick. The reason for this expected increased demand is not that there will be an increase in the actual numbers of persons so affected (although this may become a factor with the old age group) but rather that if the government is to give free care to all such persons, those now being cared for by private families and at private expense will wish to be relieved of this care and expense. It should be noted also that mental hospitals are practically all overcrowded (10 to 35 per cent) and the public may be unwilling to tolerate continued overcrowding, which would interfere (as it does at present) with healthful and efficient care and treatment. (Appendices 1 and 3).

4. COSTS OF THE MENTAL HEALTH SERVICES

The gross cost to a province of caring for a resident patient in a mental hospital amounts to a little more than $7 weekly, of which more than half is spent on salaries and wages. This estimate covers the cost of mental health clinics and other special treatment facilities as they are at present organized. On December 31, 1940, there were, throughout the Dominion, 44,163 patients in residence in mental hospitals and the annual gross cost of maintaining this number is approximately $20,000,000. The special question at issue in connection with proposed health insurance legislation is what proportion of the gross cost expended by the province should be recovered from the federal government under the proposed scheme. An estimate of one-ninth for this proportion has already been put forward but the consensus of the administrative authorities in the province is that this figure is too low and should be advanced to one-quarter.

The proportion eventually agreed upon should be applied to the daily average gross per caput cost of patient maintenance.

The following points have been made in support of this view:

1. In certain provinces, where a large number of patients contribute towards their own maintenance, the amount forfeited if all patients were treated free of charge would be much more than one-ninth of the gross cost of care for all patients. (See appendix 4.) In some instances the revenue from patients has at times exceeded one-third of the gross expenditure.

2. In provinces where it has not been possible to reclaim from patients more than a small proportion of the expenditure, this has been due to exceptional conditions such as agricultural depression and must not be considered normal for the Dominion.

3. If there is to be an extension of mental health services in the manner described in the earlier part of the report, by enlarging the preventive mental health services and outlaying capital expenditure for new wards or buildings, there would be need for federal assistance which could not be covered by so low a figure as one-ninth of the provincial expenditure.

4. Health insurance is likely to increase the demand for hospital facilities chiefly among those groups of persons who are now spending their money in keeping patients out of hospital. This means that there will be a virtual increase in the proportion of paying patients in the hospitals, which is not allowed for in the one-ninth estimate.

5. SUMMARY

The recommendations put forward in this brief are summarized in the following suggested plan for a complete mental health service.

(*a*) Out-patient psychiatric service for children and adults, in general hospitals.

(*b*) In-patient psychiatric wards for children and adults, in general hospitals.

(*c*) Travelling and/or stationary mental health clinics.

(*d*) Mental hospitals for long treatment cases which shall include the following types of organization:—

1. Centre for tuberculous mental patients.
2. Centre for neurosyphilis and post-syphilitic conditions.
3. Centre for elderly and senile cases.

   These are to be centres in existing mental hospitals.
4. Farm colony and industrial centre for long-duration cases not requiring active treatment.
5. Hospital or separate ward for convulsive disorders.
6. Training school for defectives—all ages—separate institutions (in large provinces) or divisions of existing institutions (in small provinces).

(*e*) Separate institution for alcoholism and drug addiction.

(*f*) Boarding-out facilities enlarged for all services.
(*g*) Social service for follow-up, prophylaxis, placement, etc.
(*h*) Occupational therapy extended to all services.
(*i*) Private sanatoria for those wishing such accommodation.
(*j*) Education for medical students, graduate physicians, undergraduate and graduate nurses, social workers, occupational therapists, in medical schools and associated hospitals and also school teachers and other persons connected with training of children.
(*k*) Psychiatric research.

APPENDIX

(1) TABLE OF BED CAPACITIES OF HOSPITALS IN CANADA, JANUARY 1, 1940

Type of Institution	Number of Beds	Percentage of Beds
Public		
General	46,344	39.0
Women's	1,019	0.9
Children's	1,293	1.1
Isolation	1,437	1.2
Convalescent	887	0.7
Red Cross	621	0.5
Incurable	3,094	2.6
Not Classified	2,774	2.3
Private	3,915	3.3
Special		
Dominion	9,436	7.9
Mental	39,277	33.0
Tuberculosis	8,873	7.5
Total	118,970	100.0

The bed occupancy of public general hospitals is approximately 60 to 70 per cent, that for tuberculosis sanatoria 90 per cent and for mental hospitals over 110 per cent. Thus, in comparing the amount of hospitalization of mental patients with others, the figure of 33.0 per cent shown in the table, gives too low an estimate. The actual number of mental patients hospitalized is probably nearer one-half than one-third of all hospital patients.

(2) MINIMUM STANDARDS FOR THE OPERATION OF MENTAL HOSPITALS SET UP BY THE AMERICAN PSYCHIATRIC ASSOCIATION IN 1925 AND RE-AFFIRMED FROM TIME TO TIME SINCE THEN

1. The chief executive officer must be a well-qualified physician and experienced psychiatrist whose appointment and removal shall not be controlled by partisan politics.

2. All other persons employed at the institution ought to be subordinate to him and subject to removal by him if they fail to discharge their duties properly.

3. The positions and administrations of the institution must be free from control for the purposes of partisan politics.

4. There must be an adequate medical staff of well-qualified physicians, the

proportion to total patients to be not less than 1 to 150 in addition to the superintendent, and to the number of patients admitted annually not less than 1 to 40. There must be one or more full-time dentists.

5. There must be a staff of consulting specialists at least in internal medicine, general medicine, general surgery, organic neurology, diseases of the eye, ear and throat, and radiology, employed under such terms as will ensure adequate services.

6. The medical staff must be organized, the services well defined and the clinical work under the direction of a staff leader or clinical director.

7. Each medical service must be provided with an office and an examining room containing suitable conveniences and equipment for the work to be performed, and with such clerical help specially assigned to the service as may be required for the keeping of the medical and administrative records.

8. There must be carefully kept clinical histories of all the patients, in proper files for ready reference on each service.

9. Statistical data relating to each patient must be recorded in accordance with the standard system adopted by the Association.

10. The patients must be classified in accordance with their mental and physical condition, with adequate provision for the special requirements for the study and treatment of the cases in each class, and the hospital must not be so crowded as to prevent adequate classification and treatment.

11. The classification must include a separate reception and intensive study and treatment department or building, a special unit for acute physical illnesses and surgical conditions, and separate units for the tuberculous, and the infirm and bed-ridden.

12. The hospital must be provided with a clinical and pathological laboratory, equipped and manned in accordance with the minimum standards recommended by the Committee on Pathological Investigation.

13. The hospital must be provided with adequate X-ray equipment and employ a well-qualified radiologist.

14. There must be a working medical library and journal file.

15. The treatment facilities and equipment must include:

(*a*) A fully equipped surgical operating room.

(*b*) A dental office supplied with modern dental equipment.

(*c*) Tubs and other essential equipment for hydrotherapy operated by one or more specially trained physiotherapists.

(*d*) Adequately equipped examination rooms for the specialists in medicine and surgery required by the schedule.

(*e*) Provision for treatment by physical exercises and games and the employment of specially trained instructors.

(*f*) Adequate provision for recreation and social entertainment.

16. Regular staff conferences must be held at least twice a week where the work of the physicians and the examination and treatment of the patients will be carefully reviewed. Minutes of the conference must be kept.

17. There must be one or more out-patient clinics conducted by the hospital in addition to any on the hospital premises. An adequate force of trained social workers must be employed.

18. There must be an adequate nursing force, in the proportion of total patients of not less than 1 to 8, and to the patients of intensive treatment and acute sick and surgical units of not less than 1 to 4. Provision must be made for adequate systematic instruction and training of the members of the nursing force.

19. Mechanical restraint and seclusion, if used at all, must be under strict regulations and a system of control and record by the physicians, and must be limited to the most urgent conditions.

Reference:

Medical Journal of Psychiatry, September, 1933, pages 423-425 incl.

In the report of the Psychiatric Standards and Policies Committee of the American Psychiatric Association published in the American Journal of Psychiatry 1940, Vol. 97, page 462, minor changes in the schedule were proposed.

(3) NUMBER OF BEDS AND NUMBER OF PATIENTS IN MENTAL HOSPITALS COMPARED WITH NUMBER OF PERSONS IN GENERAL POPULATION DECEMBER 31, 1940

	Number	Number per thousand of general population
Beds	39,441	3.45
Resident Patients	44,163	3.87
General Population	11,422,000	1,000.00

Since these figures for patients include defectives and epileptics, the number per 1,000 should be from 5.0 to 5.5, that is to say, 4.0 for the mentally disordered and 1.0 to 1.5 for the mentally defective and epileptic. To reach the proportion of 5.0 per 1,000 for beds would require the addition of more than 17,000.

(4) FIRST ADMISSIONS TO MENTAL HOSPITALS OF PERSONS OVER 60 YEARS OF AGE

	Number	Number over age of 60	Per cent over age of 60
Canada, 1940	6,989	1,324	19.0
Ontario, 1940-41	2,304	499	22.6

(5) MENTAL HOSPITAL GROSS EXPENDITURES

Province	Gross Expenditure	Patient Maintenance Revenue	Per cent Recovered	Proportion Recovered
Ontario, 1942-3	$ 5,600,000	$1,230,000	22.1	1/4.5
Manitoba, 1942-3	977,000	186,000	19.0	1/5.2
Sask., 1942-3†	1,700,000	125,000	7.4	1/13.6
Canada, 1940*	$19,543,000	$2,061,000	10.5	1/9.5
(Proposed grant from Federal Government)			11.1	1/9.0

†*Estimated.*

**This figure, supplied by the Dominion Bureau of Statistics, 1940 report, includes federal hospitals.*

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EFFORTS FOR THE COMPULSORY PASTEURIZATION OF MILK IN THE PROVINCE OF QUEBEC

IN 1938 province-wide pasteurization of milk was established in Ontario by an amendment of the Public Health Act, with the result that today 98 per cent of all milk offered for sale is pasteurized. Ontario is believed to be the first electoral area of its size in the world to make pasteurization compulsory. The importance of the measure is shown by the subsequent reduction in the incidence of typhoid and paratyphoid fevers, brucellosis, and other diseases transmitted through milk—a most effective answer to those who opposed the introduction of compulsory pasteurization.

Pasteurization has become a subject of intense public interest in Quebec and it is predicted that Quebec will be the second province in Canada to adopt legislation barring the sale of raw milk. Indicative of informed opinion is the fact that more than sixty-five influential organizations have petitioned the provincial government to pass such legislation. These include not only medical, nursing and public health bodies, but also religious, educational and even commercial institutions. The contribution which the Health League of Canada has made through its Quebec Division in leading this widespread movement is an excellent example of what may be done by a voluntary health agency in developing public opinion favourable to progressive legislation.

Throughout Quebec the press has been a powerful ally in educating and directing public thought on this subject. The radio too has been fully utilized. The Deans of the Faculty of Medicine and other members of the staff of Laval University, McGill University, and the University of Montreal, with a number of other prominent leaders in public health both of the Province and of the City of Montreal, have stressed the importance of pasteurization. These addresses have been published in an attractive volume entitled "La pasteurisation obligatoire du lait—opinions de sommités médicales." This handbook of salient facts is of great value to everyone interested in safe milk supplies. Dr. Albert LeSage, Dean of the Faculty of Medicine of Laval University and President of the Quebec Division of the Health League of Canada, has been responsible for its preparation. In addition, other printed matter used in the campaign has been

bound and copies have been sent to the principal libraries, the medical schools, and health departments.

In other provinces, too, the movement for the adequate safeguarding of milk by inspection and pasteurization is making good progress, although the war has made it difficult to obtain pasteurization equipment. The requirements of the armed forces for safe milk supplies have focused attention in many communities on the unsafe conditions which exist, and have led to the introduction of pasteurization plants and a program of milk control. Without question, pasteurization of milk will, in the near future, be deemed as essential for all communities, whether large or small, as is the proper filtration and chlorination of water.

A WEEK OF PUBLIC HEALTH CONFERENCES

SEVERAL meetings of interest to public health workers will be held in Toronto during the first week of October. Medical health officers of cities and of full-time rural health units, together with other health workers within easy access of Toronto, are invited to attend the sessions of the Canadian Public Health Association, which will be held in the Royal York Hotel on Monday and Tuesday, October 4th and 5th. The Canadian Tuberculosis Association will convene its Executive Council on Tuesday afternoon and will hold its annual meeting on Tuesday evening. On Tuesday morning there will be a conference of the Sanatorium Superintendents of Ontario. The Canadian Institute of Sanitary Inspectors, Ontario Branch, will meet on Monday and Tuesday. On Wednesday evening the Health League of Canada will hold its annual meeting.

The Canadian Public Health Association's conference, which is replacing the usual annual meeting, will provide four sessions for the formal and informal discussion of problems of medical health officers and other public health workers. The program will include reviews of recent advances in the various fields of public health—nutrition, mental hygiene, industrial hygiene, tuberculosis, communicable-disease control, venereal-disease control, maternal hygiene, child hygiene, and cancer control; the integration of preventive and curative medicine in the proposed plan of national health insurance, presenting the views of organized medicine and of public health; health insurance from the public health standpoint; housing from the viewpoint of public health; the treatment of poliomyelitis; epidemic meningitis; and virus pneumonia. Plans for the post-war provision of full-time local health services for all parts of Canada will be outlined by the provincial deputy ministers of health.

Canadian authorities will include Dr. D. Sclater Lewis, President of the Canadian Medical Association, while among the guest speakers will be Dr. Thomas Francis Jr., of the School of Public Health, University of Michigan, and Dr. C.E.-A. Winslow, Professor of Public Health, Yale University.

CURRENT HEALTH LITERATURE

An Endemiological Study of Bact. Typhosum Type D4

DURING 1941-2 in England and Wales bacteriophage typing of typhoid bacilli led to the identification of 19 D4 excreters. Some of these cases occurred singly and some in small groups over a wide area of Buckinghamshire and the fringe of Hertfordshire. Milk was suspected as the vehicle of infection early in the series of cases, but proof was lacking. It came from a common depot in Hertfordshire, was distributed by a number of retailers and some of the milk was consumed raw. Investigation of Case 16 led to the discovery of a farmer who was a chronic carrier of D4 typhoid bacilli and who had milked regularly and supplied milk to the depot. While the organism was not recovered from the milk and it could not be proven that this particular milk was consumed by the patients, circumstantial evidence that the infection followed such a path was very strong, for this series with one exception included all Type D4 typhoid bacilli recovered in England and Wales in 1941 and 1942. The type of the organism supplied the continuous thread throughout the story.

W. H. Bradley, B.M.J., 1943, April 10, p. 438.

Foot-and-Mouth Disease in Man

THE author describes two cases of foot-and-mouth disease in man and raises the questions of its frequency and importance. The first case apparently acquired his infection through a wound by a splinter from a butcher's table and the second from raw milk. The disease is characterized by headache, weakness and pain in the extremities followed later by excessive salivation, vesiculation and ulceration of the oral mucous membrane, perioral vesiculation, and finally vesicles on soles of the feet, palms of the hands and around the fingernails. The vesicles contain a turbid serous fluid but heal without cicatrization. The temperature may be quite high at first or remain normal throughout the course of the disease. Changes in the internal organs, in the blood or in the sedimentation rate were not noted.

Diagnosis of the first case led to a search for and the discovery of cases among cattle in the district. It is suggested that because of its mildness the disease may be frequently missed in man and that such human sufferers may be a means of spreading the infection in cattle.

Henry Dlugosz, B.M.J., 1943, Feb. 13, p. 189.

Epidemic Nausea and Vomiting

THE condition described in this paper is of interest and importance because of its resemblance to food-poisoning or dysentery. The bulk of the cases reported here occurred in school populations but investigation showed that cases of the disease were present in the town prior to the school outbreaks. The latter were explosive in character and quite extensive, 216 out of a population of 611 being attacked in the girls' school or 28 per cent approximately. In certain groups the incidence was much higher than this. The disease was not restricted to the young, cases occurring in the middle-aged and elderly as well.

Clinically, vomiting was the predominant feature. In the young it tended to be projectile in nature, but not in adults, many of whom suffered only a prolonged period of nausea. Nausea was invariably present, either occurring with or preceding the vomiting for a period of hours or days. Vertigo was common, pain from colic absent, and diarrhoea of minor importance. Characteristic physical findings were lacking. Pyrexia was a constant feature but the temperature seldom rose above 100° and was rarely of more than 24 hours' duration.

Neither clinically nor epidemiologically did this outbreak fit the picture of

food-poisoning as it is generally recognized. While the incubation period could not be determined accurately, it appeared to be within a range of 2 to 7 days. The investigation strengthened the impression of previous writers that epidemic nausea and vomiting is an upper respiratory infection.

W. H. Bradley, B.M.J., 1943, March 13, p. 309.

Experiences with Typing of Typhoid Bacilli by Means of Vi Bacteriophage

THIS paper gives an account of the results so far obtained from application of the bacteriophage typing technique to cultures of *S. typhi* collected in England, Wales and Scotland. Strains examined were from 440 cases and carriers. Of this number, 8 were devoid of Vi antigen and could not be typed. Of the remaining 432 strains 84.1 per cent were successfully typed while 15.9 per cent were untypable or "imperfect" Vi forms. Twelve Vi-phage types were identified but the relative frequency of the various types in the British Isles could not be ascertained as the survey was not sufficiently complete. The epidemiological significance of Vi-phage types of typhoid bacilli was borne out by the fact that each of the chronic carriers tested, who according to epidemiological evidence appeared to be responsible for an outbreak, was harbouring typhoid bacilli of the same Vi type as that isolated from the patients. The bacteriophage test has greatly facilitated the detection and control of chronic carriers.

A. Felix, B.M.J., 1943, April 10, p. 435.

The Vi Antigen in the Detection of Typhoid Carriers

THE author reviews the previous attempts to employ the detection of Vi agglutinins as a screen in the search for typhoid carriers and notes the discrepancies and difficulties. Since differences in Vi antigens used and procedures followed appeared responsible for the lack of agreement in results, an attempt was made to work out a satisfactory technique.

Studies were first of all directed to selecting the most suitable strain of typhoid bacillus for detection of Vi agglutinins in typhoid carriers. The Blatnagar strain was found to be the antigen of choice for Vi agglutination as well as for the preparation of pure Vi antiserum in rabbits. Methods are described for the growth and maintenance of this strain whereby maximum sensitivity can be secured consistently.

Sera from 41 typhoid carriers were tested and 37 were Vi positive with titres of 1:8 or greater, an incidence of 90 per cent positives. Of 300 normal serums received for Wassermann tests, 9, or 3 per cent, were Vi positive in titres of 1:8 or higher. A group of 104 medical students were given the regular series of typhoid vaccine (strain 58) and on testing later for Vi agglutinins 4 were positive in a titre of 1:8 or higher. This incidence was about the same as in the normal group.

Sera from 45 individuals in an endemic typhoid area were examined and 4 were Vi positive. From 2 of these typhoid bacilli were isolated. A family outbreak of typhoid was investigated similarly and the mother found to have a Vi titre of 1:16. Typhoid bacilli were subsequently isolated from her though earlier atempts had failed.

Morton Klein, J. Infect. Dis., 1943, *72*: 49.

Treatment of Epidemic Keratoconjunctivitis

THIS is a preliminary report on the use of convalescent serum intravenously for the treatment of epidemic keratoconjunctivitis. This procedure was suggested by the experimental demonstration of neutralizing substances in convalescent serum and the failure of other methods of therapy. Of 10 cases presenting the typical clinical picture, 9 showed striking clinical improvement a short time after the intravenous administration of human convalescent serum.

Additional cases treated since the report was written have shown similar results.

Alison E. Braley and Murray Sanders, J.A.M.A., 1943, *121*: 999.